

## ABSTRACT OF THE DISCLOSURE

LAYERED LOCAL CACHE WITH LOWER LEVEL CACHE OPTIMIZING  
ALLOCATION MECHANISM

A method of improving memory access for a computer system, by sending load requests to a lower level storage subsystem along with associated information pertaining to intended use of the requested information by the requesting processor, without using a high level load queue. Returning the requested information to the processor along with the associated use information allows the information to be placed immediately without using reload buffers. A register load bus separate from the cache load bus (and having a smaller granularity) is used to return the information. An upper level (L1) cache may then be imprecisely reloaded (the upper level cache can also be imprecisely reloaded with store instructions). The lower level (L2) cache can monitor L1 and L2 cache activity, which can be used to select a victim cache block in the L1 cache (based on the additional L2 information), or to select a victim cache block in the L2 cache (based on the additional L1 information). L2 control of the L1 directory also allows certain snoop requests to be resolved without waiting for L1 acknowledgement. The invention can be applied to, e.g., instruction, operand data and translation caches.

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